

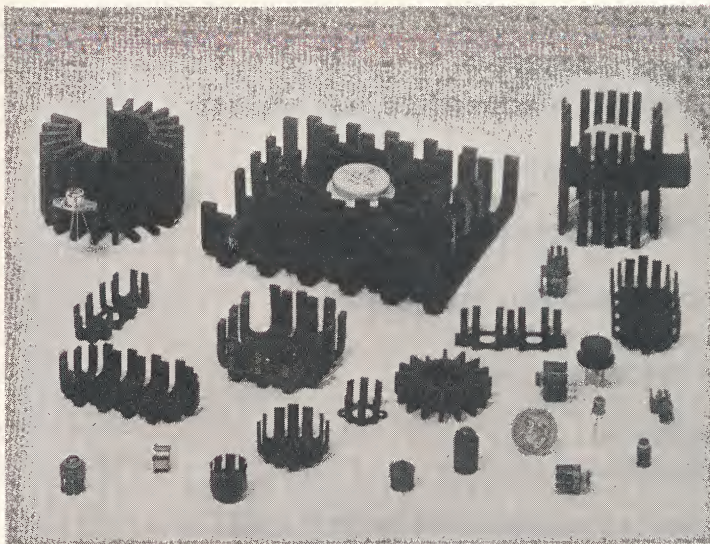
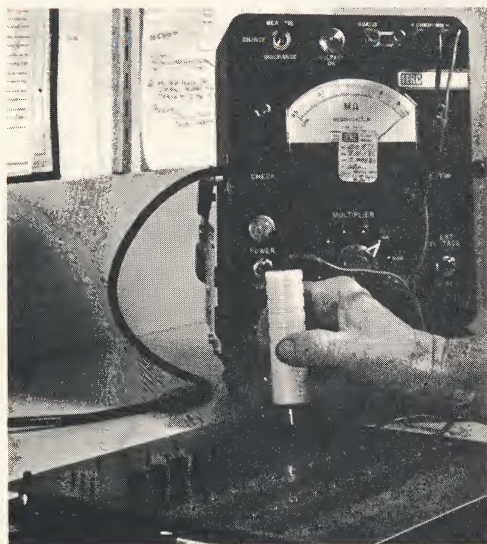


TECHNICAL BULLETIN

COATING SYSTEMS

INSULUBE® 448

INSULATING FINISH FOR IERC SEMICONDUCTOR HEAT DISSIPATORS AND OTHER ELECTRONIC EQUIPMENT PARTS



GENERAL

Insulube 448 is used exclusively on IERC semiconductor heat dissipators. It was developed to combine several properties and performance advantages not common to any other single insulating finish or material. Insulube 448 is a non-hygroscopic insulating finish with high emissivity properties for heat dissipating components. Because it is non-hygroscopic, Insulube retains its excellent dielectric and leakage resistance properties in high humidity environments. Insulube 448 is being used to replace hard anodize on thousands of parts for space applications on the Apollo, Saturn, Minuteman, Surveyor and other programs as well as standard airborne and ground equipment. The problems of bare edges with hard anodize and the problem of moisture absorption are eliminated by the use of Insulube...

In production, Insulube eliminated the need for "hard to handle" and unreliable insulating parts, such as mica washers.

Insulube, in addition to its excellent insulating properties, will withstand and protect against most all adverse environments, such as salt spray, fungus, outgassing, and is a superior dry-film lubricant. (For complete properties and specifications see reverse side.)

FACILITIES

IERC has a coating facility which is completely equipped with the most modern application and processing equipment. IERC also has a completely equipped chemistry and materials laboratory. This laboratory conducts research and development work and also monitors and maintains complete control on materials, processes and coating systems. Testing and quality control is a significant part of the laboratory and application facility operation.

DESCRIPTION

Insulube 448 is not a "paint." It is a special coating system. It can be applied to all metals and many other materials. The system starts with the proper surface preparation of the part to be coated. To this properly prepared surface the primer is applied. The basic coating which gives the insulating and protective properties, is then applied. A finish coat is applied as a thin film to increase the emissivity of the surface and also to give the surface dry film lubricating properties. The IERC Insulube 448 system without the final dry film can be obtained by specifying IERC Insultek 445.



INTERNATIONAL ELECTRONIC RESEARCH CORPORATION

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Emissivity
Hardness (Knopp)

Dull Grey - Black
.001" - .005" Recommended
7H to 8H
3/8" Mandrel (ASTM D522)
Greater than 60 Ft. Lbs. (Gardner Method)
0.27 BTU/HR. / Ft² / °F/Ft. (IERC Method)
Greater than 5000 cycles/MIL (CS17-1000gm)
(ASTM D412)
0.93 @ 25°C — 0.91 @ 92°C°
30. (ASTM D1474)

Dielectric Strength

Insulation Resistance

1000 volts DC/MIL minimum (Note 1)
(Method 301)
50,000 Megohms at 500 VDC (Note 1)
(Method 302)

Temperature Range
Salt Spray Resistance

-54°C to +200°C
 MIL-STD-202, Method 101, Cond. B,
 Unaffected after 3000 hrs.
 MIL-STD-202, Method 103A, Cond. B
 Exceeds MIL-E-5272A (All Types)

Distilled Water
Potable Water
Ketones
Alcohols
Esters
Aromatic & Aliphatic Hydrocarbons
Hydraulic & Lubricating Oils
Gasoline & Diesel Fuel
Skydrol 500A and 7000
Sulfuric Acid (25%)
Citric Acid (10%)
Ammonium Hydroxide Fumes
Liquid Detergent
Sodium Chloride (25%)
Ferric Chloride (5%)
Sodium Hypochlorite (5%)

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Note 2: Results of additional solvent and chemical tests are available upon request.

Consult the IERC Engineering Department for advice on special applications of this unique coating. Finished dimensions of parts can be held to reasonable tolerances if coating thicknesses are considered when parts are built. Write for advice regarding dimensions.

Bulletin 123, 7/66



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